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bola has double contact with the tangent and the line at infinity, the parallel to the axis being the chord of contact. Hence corollary 11 may be applied to this case. The nature of the points of intersection of the given conics with the line at infinity fixes the species of the resulting conics since these points are on the resulting conics.

BOOK REVIEWS.

UNDER THE DIRECTION OF W. H. BUSSEY.

The Teaching of Arithmetic. By DAVID EUGENE SMITH. Ginn and Company, Boston, 1913. v+196 pages.

A Textbook on the Teaching of Arithmetic. By ALVA WALKER STAMPER. American Book Company, New York, 1913. 284 pages.

Considerable attention should be paid to the teaching of arithmetic by all of those who have in charge the training of teachers and administrative officers of the public school system. Hence the universities as well as the normal and training schools should provide instruction along these lines. Both of these texts under discussion are well adapted for this purpose and it is to be hoped that they will enjoy wide use.

Eleven years ago Professor Smith and Professor McMurry of Teachers College prepared for the Teachers College Record an able article on the teaching of arithmetic. This was well adapted for instruction purposes and was so used until the edition was exhausted. In 1909 Professor Smith prepared for the same journal a new article with the same title and used some of the same material. This was also published in book form by Teachers College. The latter has been somewhat revised and expanded for this work from the press of Ginn and Co. The discussion of number games, briefly treated before, has been elaborated into a useful chapter. The chapter entitled "Subjects for Experiment" deserves the close attention of educators. Similar suggestions have been made in the MONTHLY for such experiments in connection with the high school and college mathematics. In this treatment some reference should certainly have been made to the tests for measurement of the efficiency of instruction in arithmetic, notably those suggested by S. A. Courtis. As a part of the recent examination of the New York City Schools such tests were used and in schools all over the country similar tests are being made. A discussion by Professor Smith of the value of these tests would have been a valuable and timely addition to the work.

The second of these works, by A. W. Stamper, takes up the topics much more in detail and does not treat the larger and more general phases of the subject. For this reason this book may be found more useful by normal schools and training classes. Some of the historical matter in this text is misleading. Thus it is quite incorrect to say that "the science of algebra originated in the fourth century B. C. in the Greek city of Alexandria in Egypt." Sciences do not originate in this definite and precise way and Alexandria is not connected with its origin as intimately as Egypt and possibly India. Similarly trigonometry did not have its initial development in that city. A serious fault in this work seems to the reviewer to be the neglect to emphasize the decimal character of our number system and the import of this fact for the instruction in arithmetic. Constant emphasis on the decimal character of our number system, and use of it, greatly simplifies the work of computation and leads to a better understanding of the processes of reckoning. For instance, on page 50 it is suggested that in mentally adding, 85, 25, and 40, we should first add 15 to 85 making 100, then add the remaining 10 of 25, and finally add 40. This, it seems, is contrary to all well known methods of rapid mental computation which universally proceed from left to right. In this problem the child should be taught to first add 20 to 80, then add 40, and finally add the two remaining fives. These suggestions may seem to be trifles but it is precisely in these trifles that pupils obtain or lose comprehension of the processes of arithmetic.

Both authors recommend the so-called Austrian, or additive, method of subtraction but neither one presents the application of this system to problems in long division in which, instead of writing down the partial products, one writes only the successive *remainders*. Thus to divide 13650 by 243 the plan is as follows:

$$\begin{array}{r} 243)13650(56 \\ 150 \\ 42 \end{array}$$

$5 \times 3 = 15$; $5 + 0 = 5$. $5 \times 4 = 20$; $20 + 1$ (carried) $= 21$; $1 + 5 = 6$. $5 \times 2 = 10$; $10 + 2$ (carried) $= 12$; $12 + 1 = 13$. The 0, 5, 1 are set down in turn and form the remainder when 5×243 is subtracted from 1365. Proceeding in the same way the next product 6×243 is not set down but simply the remainder. In most European schools where the additive method is taught this form of long division is suggested. It is easily mastered and saves much of the *longness* of long division.

Both of these works are notable and desirable additions to the literature on instruction in arithmetic. Mathematicians have somewhat neglected this field and, partly in consequence, the erroneous notion has become rather widespread that the less an individual knows about mathematics the better qualified he is to write on arithmetic and instruction in arithmetic. These works present the material from the standpoint of the trained mathematician who is at the same time familiar with the elementary schools. Their influence will be felt in elementary instruction.

L. C. Karpinski.

Analytic Geometry and Principles of Algebra. By Alexander Ziwet, Professor of Mathematics at the University of Michigan, and Louis Allen Hopkins, Instructor in Mathematics at the University of Michigan. New York, The Macmillan Company, 1913. In the series edited by E. R. Hedrick. viii+369 pages and 150 figures.

As far back as the oldest inhabitant can remember it has been considered the proper thing to write text-books, and publishers are usually eager to assist the